Take-Home Quiz 5 (*Due at 7:00 p.m. on Fri. October 12, 2007*)

Division: **ID#:** **Name:**

Let A be the 4×4 matrix given below and B the submatrix that remains after 1st row and 2nd colum are deleted from A.

$$A = \begin{bmatrix} 3 & 2 & 1 & 0 \\ 1 & 0 & -1 & -3 \\ 0 & -2 & 1 & 1 \\ 1 & 0 & -1 & -1 \end{bmatrix}, \; B = \begin{bmatrix} 1 & -1 & -3 \\ 0 & 1 & 1 \\ 1 & -1 & -1 \end{bmatrix}.$$

Let $M_{i,j}$ be the minor of the (i, j) entry of A above, i.e., the determinant of the submatrix after ith row and jth column are deleted from A. In particular, $M_{1,2} = \det(B)$.

1. Find $\mathrm{adj}(B)$, the adjoint of B. (*Not* $\mathrm{adj}(A)$*!*)

2. Find $\det(B)$ and determine whether or not the matrix B is invertible.

3. Express $\det(A)$ by the cofactor expansion along the 1st row using minors $M_{i,j}$.

4. Express $\det(A)$ by the cofactor expansion along the 2nd column using minors $M_{i,j}$.

5. Find $\det(A)$.

Message 欄：これまでの Linear Algebra I について。改善点について。[HP 掲載不可は明記のこと]